

ASTP (USSR) MISSION SR157/1  
Time: 15:01 CDT, 127:41 GET  
7/20/75

KIO (This is Moscow. Time is 23 hours 2 minutes. The 88th orbit now of the Soyuz 19 spacecraft, in the 127th hour of its flight. The Cosmonauts are sleeping prior to tomorrow's very tiring, very difficult day. Based on the telemetric data received from the tracking station cosmonaut Yuri Gagarin we will tell you more of the data a little later on. For the present time, listen to some of the orbit parameters for the Apollo Soyuz - for the Soyuz 19 spacecraft: The apogee is 217.93 kilometers; perigee is 211.47 kilometers; period of revolution is 88.73 minutes; the angle of the equator is 51.78 degrees. At the present time the spacecraft is in the northern hemisphere above the African continent. The next communication with the Soyuz will take place in 1 hour and 12 minutes through the tracking vessel Cosmonaut Yuri Gagarin. This is Moscow MCC. Out.)

KIO (This is Moscow MCC. It is now night time in Moscow, 21st of July, 1975. The 88th orbit around the Earth has just begun, orbit performed by the Soyuz 19 spacecraft. At the present time the spacecraft is located - located above the Pacific Ocean and coming up to the continent of North America. Based on a telemetric data received downlink, off of the 88th orbit, through the tracking ship Yuri Gagarin, the onboard systems of the spacecraft are all functioning normally. The descent vehicle air pressure is 748 millimeters of mercury, in the orbital module, 737 mmHg. The air temperature in the descent vehicle is 18 degrees .34 Celsius; in the orbital module, 20 degrees Celsius. The sixth working day of the crew has come to an end. The cosmonauts are asleep. Looking ahead to the parameters of the 88th orbit, the apogee is 217.8 kilometers. The perigee is 211.5. The period of revolution of the Soyuz is 88.72 minutes, and the angle off of the Earth's surface is 51.7 degrees. In 14-1/2 minutes the Soyuz 19 will come into the AOS of the tracking vessel Cosmonaut Yuri Gagarin. This is Moscow MCC. Out.)

KIO (This is Moscow MCC. It's now 1 o'clock in the morning, Moscow time. The 88th orbit of the Soyuz spacecraft is coming to - the 80 - end of the 88th orbit. It is now over the Pacific Ocean. Based on a telemetric data received from the spacecraft through the ship Yuri Gagarin, the condition of the onboard systems are all normal; pressure is 748 in the descent vehicle; and in the orbital module, 737.1 millimeters of mercury. The temperature of the air in the descent vehicle is 18.2 degrees Celsius; in the orbital module, 20 degrees Celsius. The cosmonauts are continuing their sleep cycle. The regular communication with the tracking ship will take place in the 89th orbit through the tracking vessel Cosmonaut Yuri Gagarin. Prior to the communications cycle, there's 47 minutes left. And so the 130th hour of the Soyuz spacecraft's circling the Earth is coming to an end. Today the spacecraft is going to land back on Earth. This is Moscow MCC. Out.)

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Time: 15:01 CDT, 127:41 GET  
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KIO (This is Moscow MCC. Moscow time is 2 hours 31 minutes. The Soyuz spacecraft is continuing its flight in its orbit around the Earth. At the present time the cosmonauts are continuing their sleep cycle. This is Moscow MCC, and we are carrying out the data processing on telemetric and other data received from the spacecraft. The following parameters for the following orbit are as follows: At 2 hours and 53 minutes Moscow time will go across the equator. 217-1/2 kilometers is the apogee; 211 is the perigee. Period of revolution is 88.2 minutes; the angle off of the equator is 71.7 degrees. In 3 hours and 22 minutes the spacecraft will go into LOS and come back into AOS (garble). Moscow MCC. Out.)

END OF TAPE

ASTP (USSR) MISSION SR158/1  
Time: 22:17 CDT, 134:57 GET  
7/20/75

KIO (This is Moscow Control. Moscow time is 6 hours 17 minutes. Soyuz 19 is - has been flying for 134 hours and 56 minutes. Cosmonauts are continuing to sleep. According to telemetry, data the crews health and the systems - there are no comments regarding the cosmonauts or the onboard systems. In 8 minutes the spacecraft will enter - will have AOS with the tracking ship Sergei Korolev. This is Moscow Mission Control.)

KIO (Moscow Mission Control. Moscow time is 6 hours and 47 minutes. The spacecraft Soyuz 19 has been in flight for 135 hours and 27 minutes and is completing the 92nd orbit. According to the results of telemetry data received from onboard the spacecraft, the set vehicle pressure is 746 and the temperature is 17.5 degrees Centigrade; pressure in OM is 747 millimeters, and temperature of the air in the OM is 18.9; the pressure in the instrument module is 800, and the temperature is 11 degrees Centigrade. It says spacecraft is slo - is in the solar spin mode, rotating at 3 degrees per second. This distance between the spacecraft is - is 676 kilometers. This is Moscow Mission Control.)

KIO (... Control Center. Moscow time 7:17. GET 135:57. The spacecraft is completing 92nd orbit. The following parameters are for the 93rd orbit: ... 7:19 Moscow time, maximum height 217.14, minimum 210.74; period of rotation, 88.71; inclination towards the equator, 51.78 degrees. The spacecraft will enter night shade, and will leave it at 8:29 Moscow time. The following is the program for the remaining - remaining ... deorbiting and landing. In preparation for descent, the crew has to put on PGA's, go in descent vehicle, close the hatch between orbital module and descent vehicle, lower the pressure in the orbital module up - by 150. Then the crew will check the rating of the systems. The systems are turned on automatically, calculated time. After the retrorocket is turned off the two - two modules separate. The thermoshield - after the descent begins the thermoshield is activated, the parachutes are deployed, and just prior to landing - reaching the ground, small retro-rockets are activated. The descent system is prepared for the land - soft landing, but it can land also and - in water. After they reach the ground they will - the crew will open the hatch and will start unstowing photo cameras, various gifts, et cetera. If need be, they can also - they have onboard with them emergency equipment, including food. After the cosmonauts leave the descent vehicle, they will donn PGA's, put their flight suits on. They will have a medical intro - check. This was Moscow Center for the Soyuz flight.)

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Time: 23:29 CDT, 136:09 GET  
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USSR ((Garble) and 43 seconds. Soyuz, welcome into AOS, tracking station of the USSR.)  
CC-M (Soyuz, this is Moscow. How's everything?)  
USSR (Everything normal.)  
CC-M (Okay, we're impatiently waiting for your report on how everything is onboard.)  
USSR (Everything is normal, nominal. We just got up. We checked the systems - on board systems. Everything is nominal.)  
CC-M (We're happy to hear from you. Greetings from your family and friends. Everybody is waiting for you personally here on Earth. Soyuz, this is Moscow.)  
USSR (Thank you very much for the greetings.)  
CC-M (Soyuz 2, this is Moscow. How about receiving some pads?)  
USSR (Okay, we have the data. But give it to us, we'll check it.)  
CC-M (14:23, pad 23. Let's begin from 98th orbit to 100th. 98th orbit, beginning of orbit, 14 42 57, comm through Moscow. 14 55 15 17 entering to night shade 15 16 15 53 exit. 99 beginning 16 11 39. Moscow comm 16 28 16 43, shadow 16 45 17 21. 100th orbit beginning 17 40 21 18 01 18 14. Shadow 18 14 18 50. How did you read? 23.)  
USSR (We copied it. Everything's good.)  
CC-M (Okay this is 14.)  
USSR (I'm ready.)  
CC-M (96 orbit, burn 0 57.6, time of start 11 51 09. Main engine 194 seconds, 194 seconds. Angle 0 86, 086. 96th orbit again. Start 13 11 47; 98th orbit starts 14 44 09.)  
USSR (09.)  
CC-M (That's correct. Last line is 09. 99th orbit start 16 15 57, 100th orbit, start 17 43 37. How did you copy?)  
USSR (Repeat 99.)  
CC-M (Repeating, orbit 99 start 16 15 57. How did you copy?)  
USSR Confirmation of data. (English)  
CC-M (You copy correctly. This is Moscow.)  
CC-M (Okay, what's happening. I have one more question for you. Soyuz 2. Okay. Did you check the liquid oxygen? Sensors, did you turn them on?)  
USSR (Yes, I have. But the pad for - -)  
CC-M (Okay, prepare for the correction of globe, we'll give it to you next orbit, or next comm session.)  
CC-M (Okay, this is the weather conditions. Visibility up to 10,000 miles. Okay, wind direction is easternly; wind velocity is about 5 meters per second. Temperature from 28 to 34.)  
USSR (Okay, sounds like the weather's very good.)

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CC-M (Yes, the weather is very good. Soyuz, this is Moscow.  
Other than donning the PGA's, do you have anything else that you have to  
do as far as preparation?)

USSR (No, we have completed everything. Okay, all we have  
to do is don the PGA's and prepare for breakfast.)

CC-M (Okay, good hearty appetite for your breakfast. We  
have 1 more minute to LOS, we'll be in stand-by mode. This is Moscow.  
Next comm session with Moscow on VHF 09:00:09:14.)

END OF TAPE

ASTP (USSR) MISSION SR160/1  
Time: 23:58 CDT, 136:36 GET  
7/21/75

KIO (GET 136:38. Soyuz is in 93rd orbit of flight. Distance between the 2 crafts Soyuz and Apollo, is 723 kilometers. There was a comm session with the crew from Moscow Mission Control. The cosmonauts awakened, performed the morning toilet, checked the onboard systems, and reported about - that everything was normal. They are in good spirits, good health, they have made preparations for descent, stowed - stowed the temporary stowage bags and contained too, monitored the systems, then they will have breakfast, and again will resume to - resume preparation for descent. They will don their PGA's. The cosmonauts asked about the weather for the landing territory. This is the weather for the area: Cloudiness is 6 to 9 units, ceiling is about 1000 meters, visibility is about 10 kilometers, wind is easterly, wind velocity 5 meters per second. This was Soviet Mission Control Moscow.)

KIO (Soviet Mission Control Center. Moscow time 8:38. GET, 137:18. Soyuz 19 is in its 93rd orbit. On the telemetry data received from the ship, DM pressure - descent vehicle. Temperature 70.37. Pressure in orbital module 745; temperature 19.4. Pressure in assembly module, 851.4; temperature, 11.2. Soyuz is now performing solar spin 3 degrees per second. For 94th orbit the following parameters for the orbit are: they will pass equator 8:48 Moscow time. Maximum height of orbit, 217; minimum 210.6. Period of rotation, 88.70; inclination towards the equator 51.78. They will enter shadow, 9:21 and leave 9:58. This was Moscow Central for Soyuz Flight.)

KIO (Soviet Mission Control. 8:52. The craft has been in flight 137.32. 94th orbit. There will be a following comm session and the crew will check the systems, contact Moscow, go through medical check with Moscow and don PGA's. After that the crew will close the hatch between DV and OM and will begin dump of pressure from the OM. They will depressure by 150 millimeters. The crew of Soyuz 19, is now conducting preparations for descent. This is Soviet Mission Control, Moscow.)

KIO (Soviet Mission Control Center. Soyuz 19 will acquire AOS 55 seconds through Soviet tracking stations.)

CC-M (This is Moscow. How do you read me? Soyuz, Soyuz, this is Moscow. How do you read me? Soyuz, Soyuz, this is Moscow. How do you read me? Soyuz, Soyuz, this is Moscow. How do you read me?)

USSR (Moscow, Soyuz, I read you well.)

CC-M (Roger. This is Moscow, I read you well also. How was your breakfast.)

USSR (Thank you. Everything went well.)

CC-M (Roger. Ready to receive the report from you.)

USSR (Everything is stowed, latched. Okay, pad 3, he will - Valeriy will pass on to you.)

CC-M (Okay, I'm ready for the pad.)

USSR (192 and 1. 3642 516 630 716 830 1140 1210 1210 20 8 7 18 20 20 10 1760 760 750 924 920 320 165 220 20. How did you read me?)

CC-M (Copied - we copied.)

USSR (This was 03. All systems are normal.)

CC-M (Roger. Ready for form without pad about the motion integrity. Number 81. Check.)

END OF TAPE

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CC-M (- - about the Russian (garble) Number 81 check - check  
pressure integrity. Get ready for comm session 95th.)  
USSR (Okay.)  
USSR (When will it begin? Okay because we have to calculate.)  
CC-M (Okay, this will be a regular schedule conversation with  
Moscow. 10:56 - It will be 10:26 to 10:46 or 95th orbit. The rest are all  
nominal.)  
USSR (Okay, we'll be ready to report at 10:26.)  
CC-M (Fine. Report regarding pressure integrity.)  
CC-M (This is Moscow. Okay this is data to correct globe  
pad number 2 or form number 2. Number 84; longitude, 225; period, 88 and  
72 point 72; orbit, 93.4; time of start 09:26:09. How did you read me? How  
did you copy?)  
USSR (Number 84; longitude 225; period 88.72; orbit 93.4; time  
09:26:09.)  
CC-M (Copy correctly.)  
CC-M (How about a clock sync?)  
USSR (Okay, we'll get ready for a clock sync with you.)  
CC-M (Soyuz, this is Moscow. Get ready for clock sync at  
09:08. Roger how did you copy?)  
USSR (At 09:08 we'll have time sync - clock sync.)  
CC-M (Correct copy. One minute until clock sync.)  
CC-M (Soyuz, this is Moscow. 30 seconds until clock sync.)  
USSR (When should we indicate the signal? At the beginning?)  
CC-M (5 seconds left. Time sync.)  
CC-M (Soyuz, this is Moscow. This is the comm session through  
Hawaii. 10:50 Hawaii, 10:58, and how did you read?)  
USSR (10:50, and 10:58.)  
CC-M (Copy correctly.)  
CC-M (Okay, we're in standby mode, 5 minutes left in this  
conversation.)  
CC-M (30 seconds until LOS. Until we meet again in next con-  
versation.)

END OF TAPE

ASTP (USSR) PRESS CONFERENCE SR162/1  
Time: 01:38 CDT, 138:16 GET  
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KIO (Soviet - Soviet Mission Control. 9:38 Moscow time. The spacecraft is now in flight 138 hours and 18 minutes. It is in its 94th orbit. This on the telemetry data: Received regular comm session. The cosmonauts are good spirits. Also, the commander, Leonov, is 58 per minute; flight engineer Kubasov, 78 per minute. Breath rate: Leonov, 16; Kubasov, 24. All onboard systems are working nominally. The cosmonauts are getting ready for descent, according to the plan. The cosmonauts will be done [sic] the PGAs, latch - close the hatch between the OM and the descent vehicle. This was Soviet Mission Control, Moscow.)

KIO (Soviet Mission Control Center. Moscow time, 9:54. The spacecraft 19 has been flying 138 hours and 34 minutes. It is in its 94th orbit. The 490 - 495 orbit - 95th orbit has following parameters: It will pass the equator at 10:16. Maximum height, ... minimum, 1210.4; period of rotation, 88.71; inclination, 51.78. It will enter shade at 10:50 and leave 11:26. According to the plan, the cosmonauts are to put - just close the hatch between descent vehicle and orbital module, hatch number 5, and are now depressurizing the orbital module by 150 millimeters. This was Soyuz Mission Control, Moscow.)

KIO (This is press conference from Moscow. 8:40 the crew began stowing the experiments and gifts and materials to be brought back. There was a comm session between Soyuz 19 and Salyut. The crew of Sal - Soyuz 19 greeted the Salyut crew and wished them the best in fulfillment of their crew - of their mission. Further comm sessions were held through Gagarin and the unmanned Sputnik "Lightning 1," Eupatoria, Ussurisk. Commander of Soyuz 19 informed Mission Control that he completed the stowage of the data and returnable items to Earth. Their health is good. Pulse of Leonov is 60; Kubasov's is 64. Breathing rate: Leonov's, 20 and 16. 21:10 to 21:18, comm session. Mission Control informed them that their miss - their work was completed, that they have permission to - to rest. At this time, comrad Kravets will speak to you. Kurnikov is the interpreter.)

KRAVETS (Now you know in detail about what happened, yesterday. I'll tell you what happened in the past 2 or 3 hours. The crew arose at 7:40 this morning, had breakfast, and at 9:20 started putting on their spacesuits for the transfer to the descent module. That is all they did approximately from by the time that I had left the Control Center. At 9:50 they should have had the hatch shut between the descent and orbiting modules, and 20 minutes later depressurizing command module, depressurizing by 150 millimeters, were to check the integrity between the descent and command modules. Then they were to check the integrity of the space fi - the spacesuits, and 11:40 all descent operations will start. That's all for the past few hours. The - one of the most intense parts of the flight is still ahead.)

NBC John Dancy, NBC. Could Mr. Blagov be so kind as to give us some details of the descent itself, the speed at which the vehicle reenters the atmosphere, length of the burn, approximate length of time of the radio blackout, and so forth, material which is not in the press kit. (English)

KRAVETS (At 13:10 the engines will be turned on to leave the orbit. At 13:22 the descent module will undock from the orbit - command module. At approximately 13:28 the altitude will be about 80 kilometers, and from the



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altitude of 80 to 30 kilometers, there will be a radio blackout. The 30 kilometer altitude will be at approximately 13:35. The main parachutes will be opened at 13:37. They expect to touch down at approximately 13:50 - 13:51.)

FRANCE PRESS (Could you give us a geographical - a - geographical information on just what point of the map all these operations will take place?)

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FRANCE PRESS (Could you give us a geograph - give us geographical information on just what points of the map all these operations will take place, where will it enter the atmosphere, and so on?)

KRAVETS (The last three days I have been taking geography lessons especially. The engines would be turned on over the Atlantic Ocean, near the Island of Ascension - Ascension Islands. The separation will take somewhere - take place over central Africa. The radio blackout at TD - at an altitude of 80 kilometers will start over the Black Sea. All the rest is over Kazakhstan.)

ASSOC PRESS (Associated Press. Could you give us some report on the physical conditions of the cosmonauts this morning? Are there any irregularities, injuries ...? (English)

KIO (Once again the Associated Press.)

ASSOC PRESS And an additional question. Why did Shonin ask Leonov to take a Pamangin pill? (English)

KRAVETS (Just before leaving I spoke with our cosmonaut doctor Yegorov, so besides geography I would have to bone up on medicine too. First of all, both astro - cosmonauts were requested to take a sleeping pill. This is an ordinary mild sedative which is usually taken at the last stage of the trip. The electrocardiogram information showed that Leonov was slightly tired. Possibly many of us have a bad cardiogram right now, too.) (Laughter) (And the medicine that they took - Leonov took medicine in order to improve his cardiogram. Pamangin increases the calcium content of the blood and that improves the cardiogram.)

KIO (The Poland correspondent expresses gratitude to Vadim Kravets for the work that he has done with us here, and also the fact that sometimes comrade Kravats is something of a journalist, because we very often sign the material which he has given us. So, if he needs a recommendation for the union of journalists in Poland, we are ready to do so.)

POLISH PRESS (The question is, how many search parties are - will be out expecting to meet the ship? How many people are in each group? This is all very interesting because this is the first time that we see the landing of a spacecraft. In the Soviet Union.)

KRAVETS (I'll begin with the last question. The latest descent of the Soyuz module has been so exact that helicopters have accompanied the ship at the last stage just before touchdown. Within - within 10 minutes after the ship touched down on Earth all the necessary specialists were at the ship in order to do everything that was required of them. And we hope that today the same will happen. As for the number of people, over all people taking part in the search groups for the ship, this is a very large group. There are many planes, helicopters, a thousand people at least. And all measures have been taken to ensure the full safety of the crew at landing.)

KIO (Two questions from French television. First, what is the speed of the ship as it descends when the parachutes are open? Two, how many minutes will the blackout last? And he has one more question he'll ask later.)

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KRAVETS (The ships separate at approximately an altitude of 150 kilometers. It may be 150, 170. I don't know exactly. The blackout is about 7 minutes from 13 hours 18 minutes to 13 hours 25 minutes. The descent speed with parachutes open is 7 to 8 meters a second.)

QUERY Who heads the group of doctors at the landing site, and when will we learn of their - the results of medical examinations?

KRAVETS I don't know.

SPEAKER We were told yesterday by ... (English)

KIO Will you identify yourself please? (English)

L.A. TIMES Robert Toes, Los Angeles Times. We were told yesterday by Mr. Blagov that Soyuz had the lifting capacity, and I was just wondering, what is its range, how - what is its - the range with - within which it can land, by steering itself, after reentry? (English)

KRAVETS (In range it's approximately 700 to 1000 kilometers.)

KIO Would you repeat your question please once again. (English)

SPEAKER Are you interested in the range of control of the ship when it lands? Just how much - how maneuverable it is? (English)

QUERY No, no, no, no - Both Apollo, and Soyuz have some aerodynamic lift after they reenter the atmosphere, and they have a gliding capacity so they can steer themselves, within reason, to a landing spot. I was wondering what the area is that Soyuz can steer itself in. For Apollo, it is several hundred kilometers. (English)

KIO Well, he said 700 to a 1000 kilometers. (English)

QUERY But I gath - I gathered that's not the question that ... (English)

QUERY You understand the aerodynamic ... (English)

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KIO Well he said 700 to a thousand kilometers. (English)  
SPEAKER But I gath - I gather that's not the question that ...  
(English)

QUERY You understand the aerodynamic lifting capacity ...  
(English)

SPEAKER (... said that he has - he - he has a range of from 0 to  
a thousand kilometers. That's approximately. I may - can be mistaken by  
about a hundred kilometers.)

QUERY (The Humanité correspondent would like to know first,  
when can we expect Leonov and Kubasov in Moscow, and what will be the further  
program?)

SPEAKER (It will be tense program, I'll tell you that. And  
interesting.)

KRAVETS (He's more interested in more detail then I suggest you  
ask General Shatalov, who is in charge of all these operations. He knows  
the program in detail. Our responsibility is to put the ship down, the rest  
is his.)

SPEAKER (The Press Center will do its best to give you an op-  
portunity to meet with the crew. And I think with the aid of Comrade  
Kravets this will - we'll be able to do this.)

QUERY (Netsabatszat, Hungary. First of all, when was the first  
manned landing carried out of a Soyuz ship?)

QUERY (The control - the controlled descent of the ship then,  
not man that controlled the descent of the ship.)

KRAVETS (If we take the point of landing as 0 - If we take the  
landing point as 0, then the leeway of controlled landing is 500 kilometers  
either way. That is the full diameter of a thousand kilometers. But the  
exactness of the landing is so good that, actually, the helicopter is right  
there at the moment of landing.)

QUERY (And the second question, Netsabatszat. Could you tell  
us exactly what happened during the second docking maneuver, was it analyzed?)

QUERY (First, the - the - first question comes second. And  
when was the first controlled descent made of a Soyuz ship?)

KRAVETS (I think that was when Beregovoy was landing. The cos-  
monaut Beregovoy.)

KRAVETS (I was in contact with the Houston Mission Control Center,  
regretfully yesterday it was Sunday and not all my questions could be answered.  
We asked them many questions because we know the differences in our informa-  
tion. I think today we should receive a full answer to all our questions.  
But we can say, so far, after a short analysis, that in these extreme condi-  
tions of second docking, both mechanisms functioned well. On the Soyuz and  
on the Apollo.)

QUERY CBS News. Last night we were told that the parachute  
would be deployed at 13:35, and this morning we were told 13:37. Can you  
explain that difference, please? (English)

KRAVETS (Maybe Blagov's information was not quite correct - he  
may have - -)

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KRAVETS (Maybe Blagov's information was not quite correct - he may have from memory he may have - -)

QUERY ABC News. Can you tell us, please, what the AST - cosmonauts had for breakfast this morning? And the second question, can you tell us something about what the weather conditions are like at the landing site at the moment? (English)

KRAVETS (I'll begin with the weather, because that's my problem. The weather is good. The wind is less than 10 meters a second, and the cloud's the altitude of the clouds is over a thousand meters. This is the information we received this morning. And now we are receiving additional information every hour. In other words, the weather is good so far. I think they had a good breakfast.)

QUERY (Polish press agency, could you tell me if the descent module of the Soyuz will be used again?)

KRAVETS (Usually the Soyuz descent craft is not used again.)

QUERY (Polish newspaper, Culture. Could you tell me - you said that Leonov was slightly tired, and we saw that on the TV screens. Could you give us a comparison of the strain of work here on Earth which could be comparable to the strain which the crew of the Soyuz undergoes while up in space?)

KRAVETS (The work of a cosmonaut is very close to the strain and work of a test pilot. Approximately, the strain is somewhere similar.)

QUERY BBC. There's been several references by you during this last week to - how tired the cosmonauts and the astronauts got and the papers said they fell behind, way behind - - (English)

MCC-M That's correct.

QUERY - - work that you plan to give them. And I wonder whether you feel now in retrospect that you did give them too much to do, and what's the explanation for this, which on the face of it is surprising because both countries have had so much experience in the work astronauts can do. (English)

MCC-M (This is Soyuz 2, this is Moscow 2. what have you done for the modes - the descent modes? What was the input. That you were questioning?)

MCC-M (Soyuz 2, this is Moscow. Okay, you have indicated gyro problem, but on the basis of our telemetry, you have to put angle - okay, thank you for the help.)

KRAVETS First of all, I think the strain was not only on the crew, but on the whole ... connected with the mission. The cosmonauts and the astronauts - both crews are tired. And I personally do not recall any flight which was not strained.

SFE (I am fulfilling everything in the program of the descent.)

MCC-M (Okay, thank you for the advice. Everything is going normally.)

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KRAVETS (The work is not easy and the preliminary training is too stringent and heavy to make the flight itself simple. This can be said about the work in the - in space and also on Earth. Two more questions.)

MCC-M (Okay, everything for the program I have also. Thank you. How about writing down VHF comm session.)

USSR (We have that already.)

USSR From 96 to 100, we have them all. About time for the Ascension. Okay, through Vanguard and Ascension.

MCC-M (Okay, if you insist. Through Vanguard 12:33 - 12:40. Ascension 13:07 - 13:13. How did you copy?)

QUERY The magazine Praga-Moccow, Czechoslovakia. Could you tell us about what happened yesterday when you spoke of the slight drop in pressure due to the temperature change.

USSR (Vanguard 12:33 - 12:40. Ascension 13:07 - 13:13.)

MCC-M (Copy correctly.)

MCC-M (This is Moscow. The data on the controls seems good. Okay, continue nominally, but it's about time that you guys returned here to Earth. Medical data also receiving, it's nominal.)

KRAVETS - - between the Soyuz and the docking module. After the drop in pressure in the tunnel itself from 500 to 250 millimeters, the hatches from both sides - the integrity of the hatches from both sides are checked. Due to the fact that - in the Soyuz and in the Apollo at this time the pressure is 500 millimeters. The change in the pressure in the tunnel between the two ships checks the integrity of the ship's pressure. When the pressure drops from 500 to 250 in the tunnel, there is a sharp - there was a sharp drop in the temperature in the tunnel. 5 to 10 degrees approximately. And then slowly the gas heats up, and you know from physics that - -

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KRAVETS (... and then slowly the gas heats up. And you know from physics that when gas warms, it expands. And in the first hour or so, when this happens, the increase in pressure, we thought that there was something wrong with the integrity. And then we agreed with Houston that this was only the difference in change of temperature, it is a law of physics. One more question.)

CC-M (7 minutes until LOS. We're in standby mode. We won't bother you.)

QUERY (Yesterday we were told that the first parachute is the braking parachute. I would like to know to what altitude that parachute functions, and, besides the main parachute during the descent, is there another parachute, an extra one?)

KRAVETS (The braking parachute will be thrown out at approximately an altitude of 10 kilometers and the main parachute - the braking parachute will - function at 10 kilometers and the main parachute at an altitude of 7 kilometers. And there is an extra parachute, emergency. But in all the flights of the Soyuz, we've never used it.)

SPEAKER (The next briefing might be slightly earlier, not 6, so you will be notified soon after the landing. I'd like to wish comrade Kravets a happy birthday. It was his birthday yesterday. (Applause and laughter))

END OF TAPE

ASTP (USSR) MISSION SR167/1  
Time: 02:45 CDT, 139:22 GET  
7/21/75

CC-M (Soyuz, Moscow. 2 minutes left to LOS. Soyuz, Soyuz.  
This is Moscow. How do you read me? Over.)  
CC-M (Soyuz, this is Moscow. How do you read me? Over.)  
CC-M (This is Moscow. Over.)  
CC-M (Soyuz, this is Moscow. How do you read me? Over.)  
CC-M (Soyuz, this is Moscow. How do you read me? Over.)  
CC-M (Soyuz, this is Moscow. How do you read me? Over.)  
CC-M (Soyuz, Soyuz. This is Moscow. How do you read me?  
Over.)  
CC-M (Soyuz, Soyuz. This is Moscow. How do you read me?  
Over.)  
CC-M (Soyuz, Soyuz. This is Moscow. How do you read me?  
Over.)

KIO (Soyuz Mission Control Center. Moscow time 11:05, GET  
139:45. Soyuz is in its 95th orbit. During this orbit, Soyuz will do an  
orientation for retro firing. This command will be given by onboard auto-  
matic systems. This will be at 13:10. 13:26 the ship will enter atmos-  
phere, then at 13:36, the parachutes will open - will be deployed. This  
will be taking place over the Soviet territory. The descent vehicle is  
designed to land on land, but it can also land on - in water. A special  
recovery crew is waiting the landing, including technicians, doctors and  
certified - certification experts. All these people are prepared to render  
aid in case it is necessary. Among the vehicles employed, helicopters,  
Land Rovers - Land Rovers, airplanes, including parachutists, frogmen. The  
doctors have at their disposal all of the necessary medical hardware. There  
will be communication between the crew and the recovery - recovery team.  
After the crew descends - lands, they will open the hatch, and unstow, and  
take out various experiments, gifts et cetera, cameras. Among the supplies  
that the crew has onboard, they have thermal underwear, and other clothing  
equipment necessary for contingency situation. The crew will then take out  
cameras, will leave the orbital module, they will doff their PGA's, don  
their flight gear, and undergo medical checkups. This was Soyuz Mission  
Control Center for Mos - Soyuz flight.)

END OF TAPE



ASTP (USSR) MISSION SR168/1  
Time: 03:30 CDT, 140:08 GET  
7/21/75

KIO (Soviet - Moscow time, 11:30. Spacecraft Soyuz has been in flight 140 hours and 10 minutes. At the present time, Soyuz is completing 95th orbit. It's over the Atlantic Ocean. The crew is monitoring solar spin at 3 degrees per minute. According to the Flight Plan, the crew is preparing for descent and pumping out condensation. In a couple of minutes, the crew will begin manual orientation towards the Earth. Soviet Mission Control Center, Moscow.)

KIO (Moscow time, 11 hours 42 minutes. The 95th orbit of the Soyuz 19 is being completed. At the present time, it is over central Africa in the region of the equators. At the next, the 96th orbit, the following operations are planned. The crew of the spacecraft will go into manual mode with a 180-degree turn. In other words, the braking engine will be along the X-axis forward. After that, the spacecraft will have a comm session with the Tbilisi, Djusaly, Kolpashevo, Ulan-Ude, Ussurisk, Petropavlovsk-Kamchatsky ground station. The comm session will begin at 11 hours 54 minutes Moscow time. The comm session will end at 12 hours 17 minutes. After this, the crew will monitor the orbital orientation. At the end of the 96th orbit, over the Atlantic Ocean, it is planned to turn on the attitude and motion control system. This is Moscow Mission Control.)

KIO (This is the Soviet Mission Control Center. Moscow time is 11 hours and 50 minutes. The 96th - the second to last - the penultimate orbit of the Soyuz spacecraft has begun. The preliminary parameters for this orbit are the following: maximum altitude, 220.78 kilometers; minimum altitude, 216 kilometers; period, 88.81 minutes; orbital inclination to the equator, 51.78 degrees. 3 minutes - the next comm session will begin, and the program of which includes the following: radio communications between the crew, and trajectory measurements, commands on the command line, and telemetry data. In the 95th orbit, the following - according to the following data, the parameters of the orbit are as follows: 734.7 millimeters of Mercury pressure in the descent vehicle, 18 degrees centigrade temperature. In the orbital module the pressure is 593 millimeters of mercury; temperature 18.4 degrees centigrade. On the comm channel between Moscow and Houston Control Centers it was - the program was nominal and the condition of the Apollo and Soyuz spacecraft is nominal. This is Moscow Mission Control Center.)

KIO (This is the Soviet Mission Control Center. In 1 minute, the Soyuz spacecraft will enter the zone of coverage of the following ground stations: Tbilisi, Djusaly, Kolpashevo, Ulan-Ude, Ussurisk, and Petropavlovsk-Kamchatsky.)

CC-M (Soyuz, this is Moscow. How do you read me?)

CC-M (Soyuz, Soyuz, this is Moscow. Would you answer Moscow? How do you read?)

CC-M (Soyuz, Soyuz, this is Moscow. How do you read?)

ASTP (USSR) MISSION SR168/2  
Time: 03:30 CDT, 140:08 GET  
7/21/75

USSR (Moscow, this is Soyuz. How do you read?)  
CC-M (Soyuz, this is Moscow. I hear you excellently.  
Ready to get your report about the pressure garments.)  
SCDR (We have checked the pressure integrity of the space  
suits. And in 1 minute - 1 minute 40 seconds from 0 to this - until  
checking. We are now in orientation, 180 degrees; Y and Z orientation, 0.)  
CC-M (Tell me what time was your orientation?)  
SCDR (1:00 - 1:40, 1:40. Everything is normal so far.  
We are following the program.)  
CC-M (Roger, Soyuz. Thank you.)  
SFE (Going over the Caspian Sea now.)  
CC-M (What's the pressure there?)  
SFE (This is Soyuz 2, I'll tell you sum up later.)  
CC-M We will wait for your report on switching on the  
program, then we will give you a short radiogram.  
SCDR Roger. Understood.

END OF TAPE

ASTP (USSR) MISSION SR169/1  
Time: 03:57 CDT, 140:35 GET  
7/21/75

CC-M (Then we will give you a short radiogram.)  
USSR (Roger. Understood.)  
CC-M (Roger.)  
USSR (20:00:22. There's the program.)  
CC-M (Roger. Copy, Soyuz.)  
USSR (12:01:22.)  
CC-M (Roger.)  
MCC-M (How's the picture?)  
CC-M (Soyuz, get ready to take a formless radiogram on monitoring orientation. Number 87: After getting out of shadow, monitor orbital orientation on yaw. With more than allowable changes you are permitted to improve - correct the orientation manually. For this purpose, act with accordance with onboard instructions, page 10 - 10 7A.)  
USSR (10 7A?)  
CC-M (Page 10 hyphen 7A.)  
USSR (How did you read? Moscow.)  
USSR (After getting out of shadow, monitor orbital orientation. When entering, permissible manual orientation correction on page 10 point 7A.)  
CC-M (Roger, affirmative. Take radiogram without form.)  
USSR (Ready.)  
CC-M (Soyuz, we will wait for your detailed report on VHF AM - VHF AM in the coverage zones of Evanguard - Vanguard, 12:34 to 12:37 and over Ascension Island, 13:07 to 13:12. Everything on VHF AM. In zones of coverage of our station - station coverage, we will wait for your report from 13:25. How did you copy? This is Moscow.)  
USSR (Reports on VHF AM; Vanguard 12:34 to 12:37 and 13:07 to 13:12. And VHF BRD1(?))  
CC-M (Roger. Affirmative you copied correctly. And now you'll talk with 16.)  
MCC-M (Soyuz, this is 16. Congratulate you for your successful work and preparation for deorbit.)  
USSR Thank you.  
MCC-M (You've done all your work properly - next stage. You're being awaited at your landing place. We just checked it out. The weather is favorable. In the morning it was a little worse, now about 5 to 7 wind strength. 1800 to 2000 meter ceiling. - 1500. Some places of clouds up to 9000 meters. Visibility under the cloud cover 20 kilometers; 5 or 6 meters per second wind. Temperature 29 degrees. Pressure - pressure will be manually - manual al - altimeter for 450 and this would be approximately to 700 - equivalent to 725 millimeters on you - on your - on the - so you have about 5 to 20 seconds left between this monitoring altitude for pressure and landing.)  
USSR (450.)  
MCC-M (Right.)  
USSR (720 millimeters.)

ASTP (USSR) MISSION SR169/2  
Time: 03:57 CDT, 140:35 GET  
7/21/75

MCC-M (Roger. 450 on the manual altimeter, 725 on the manometer.)  
USSR (Thank you.)  
MCC-M (Programs (garble) Pressure's being maintained normally -  
800. Temperature, 19. Everything is proceeding according to schedule.)  
USSR (Roger.)  
MCC-M (We are watching you. We're very happy with your work.  
We also want to see, for the whole deorbit period, the same quality communica-  
tions as has been during the entire flight. May we consider that we will hear  
you at all times. So, report on everything happening during the flight on-  
board, especially during deorbit. The helicopters and aircraft will attempt  
to establish communications immediately. So, tell them anything - everything  
that's happening onboard.)  
USSR (Roger.)  
MCC-M (That's all from me about the circumstance about landing.  
Once more, everything - all the people who have gathered here - and we just had  
occasion to talk with the people are waiting for you at the landing place, they  
wish you a successful completion of the flight and a soft landing. We're wait-  
ing for you on our "Mother Earth," as they say.)  
USSR (Thank you.)  
CC-M (Soyuz, this is Moscow. 9 minutes until LOS. We are  
standing by.)

END OF TAPE

ASTP (USSR) MISSION SR170/1  
Time: 04:14 CDT, 140:51 GET  
7/21/75

CC-M (Soyuz, this is Moscow. Soyuz, we're waiting for your detailed report on the descent over Vanguard and Ascension Island, for which purpose, you should turn on the VHF-AM and have your mikes switched on.)

USSR (Roger.)

USSR (Mark 14.)

CC-M (Roger, 14 past.)

CC-M (Did not understand, Soyuz 2. Now I understand.)

CC-M (Soyuz, this is Moscow. 1 minute before LOS. We wish nominal, normal work.)

SFE (Thank You.)

KIO (This is Soviet Mission Control Center. Moscow time is 12 hours 22 minutes. Time of flight, 141 hours 2 minutes. 5 minutes ago the last comm session with the Soviet tracking stations came to an end. At the present time, the Soyuz spacecraft has left the Earth's shadow and is now over the Pacific Ocean. The program of the last comm session included radiocommunications with the crew and the Mission Control Center, reception of telemetric data, projectory measurements and also command, on a command channel. The complete - the program for the last conversation was fully completed. During the last comm session, according to telemetry data, parameters of the systems are following: pressure in the descent vehicle 772-1/2 millimeters of Mercury; temperature in the descent vehicle 17.8 degrees Centigrade; partial pressure of oxygen, 206.8 millimeters of Mercury; CO<sub>2</sub> partial pressure, 3.9 millimeters in the descent vehicle. During the comm session the crew received the 87th radiogram. The crew reported that during the calculated time the program was switched on for automatic - automatic descent operations vehicle. The next comm session will be over the U.S. tracking ship Vanguard and over the Ascension Island tracking station. During these comm sessions, the Soyuz spacecraft crew will perform its report about the deorbit. This is Moscow Mission Control Center.)

KIO (This is the Soviet Mission Control Center. On the Soyuz spacecraft, the final programs on descent - deorbit operations are under way. According to telemetry data, the condition of the spacecraft systems is normal. The cosmonauts feel well. At the present time, they're monitoring the commands for firing the retro-engines and getting ready for descent. In four minutes the spacecraft will enter the zone of coverage of the American tracking ship Vanguard. The braking ... After the braking firing ... at the firing of the engine the following parameters of the orbit will be: 218.1 kilometers. At 12.38 degrees the braking engine will fire. The firing will be at 213 kilometers altitude. This is Moscow Mission Control Center.)

KIO (This is Soviet Mission Control Center. Soyuz spacecraft in 35 seconds will enter the zone of coverage of the American tracking ship Vanguard. Correction, according to the American Mission Control Center, the zone of coverage of Vanguard will begin at 12 hours 35 minutes and will end at 12 hours 37 minutes, because the tracking angle is not sufficiently large, and therefore, the comm session may have possible interference.)

ASTP (USSR) MISSION SR170/1  
Time: 04:14 CDT, 140:51 GET  
7/21/75

CC-M Soyuz, Soyuz, this is Moscow. How do you read?  
Over. Soyuz, Soyuz, this is Moscow. How do you read? Over. Soyuz,  
this is Moscow. How do you read? Over. Soyuz, Soyuz, this is Moscow. How  
do you read? Over. Soyuz, Soyuz, this is Moscow. How do you read? Over.

END OF TAPE

ASTP (USSR) MISSION SRL71/1  
Time: 04:36 CDT, 141:14 GET  
7/21/75

CC-M (This is Moscow. How do you read? Over.)

CC-M (Soyuz, Soyuz; this is Moscow. How do you read? Over.)

KIO (This is the Soviet Mission Control Center. The comm session with the American tracking ship Vanguard is now finished. Moscow time, 12 hours 38 minutes. This is the 141st hour of orbital flight of Soyuz spacecraft. This is the second last orbit of the spacecraft. The spacecraft is now in orbital attitude hold using the infrared vertical and also the angular rate sensor. The spacecraft is oriented for braking. This attitude will be maintained until the time 12 hours and 9 minutes. At the present time, the distance between the Soyuz and the American Apollo spacecraft is 672 kilometers - 772 kilometers. The Mission Control Center's calculated the descent - deorbit data. This data has been entered into the program computer as - the crew is monitoring the orientation and also the transmission of information - data and commands for braking. The deorbit data has - is - the following parameters: the braking pulse to shift the spacecraft from Earth orbit to a descent trajectory will be 120 meters per second. This braking pulse - burn will work - will operate for 194.9 seconds at the altitude of 214 kilometers and 13 hours and 9 minutes. At this time, the Soyuz spacecraft will be stabilized using the - with orientation engines. The corrective engines will turn on at 13 hours 22 minutes ... seconds. At that point, the altitude will be 212 kilometers. The engine burn will end at 13 hours 13 minutes 35 seconds. The data from the time - control at 13 hours 22 minutes, there will be separation of the two modules; at that moment the altitude of flight will be 153.8 kilometers. At the altitude of 104.8 kilometers, the spacecraft will enter the atmosphere. The g overloads will be later at 13:18. At that point, altitude will be 85.6 kilometers. At 7 kilometers altitude at 13 hours 36 minutes 23 seconds, the parachutes of the Soyuz spacecraft will open. At 13 hours 51 minutes, the Soyuz will touch down. This is Moscow Mission Control Center.)

KIO (This is Soviet Mission Control. This is 142 hours GET Moscow time 12 hours 54 minutes. Spaceship Soyuz is coming out of shadows and ... until braking is left 15 hours - 50 minutes and 50 seconds. Soon they will have AOS Ascension. The same place is space ship - is tracking ship Korolev. The braking impulse is 120 meters per second. Time before 194.1 seconds. The heights of clouds, 1600 meters; visibility, 10 kilometers; wind velocity, 7 to 10 meters per second; temperature 30 degrees. According to previous calculation - spaceship will land, velocities ..., longitude 67, 32 ... degrees. This is Mission Control Center, Moscow.)

END OF TAPE

ASTP (USSR) MISSION SRL72/1  
Time: 05:03 CDT, 141:41 GET  
7/21/75

KIO (Soviet Mission Control Center. Moscow time is 13 hours 3 minutes. 141 hours and 43 minutes and 40 seconds have passed since the moment of launch of the Soyuz spacecraft. At the present time, it is completing the 96th orbit in flight. The spacecraft has left the Earth's shadow and is now flying over the southern part of the Atlantic Ocean. In 13 minutes, it will enter the zone of coverage of the Ascension Island tracking station. In 3 minutes, it will enter the - in 3 minutes, it will enter the zone of coverage. There's also a tracking ship near Ascension Island. This tracking ship will relay the command for braking. The first braking session - engine will fire 5 minutes 40 seconds. I'm reminding you of the coordinates of the landing point. The Soyuz spacecraft will land near the city of Arkalyk in the Kazakh Soviet Socialist Republic. The coordinates of the landing point are as follows: latitude 65:35; longitude, 32. Time, 32 hours 51 minutes. This is Soviet Mission Control Center. Less than 1 minute is left until the moment when the Soyuz spacecraft will enter the zone of coverage of Ascension Island tracking station.)

MCC-M (Soyuz, Soyuz, this is Moscow. I hear you. How do you receive?)

SCDR (Roger; I understand. I hear you excellently. Orientation is precise. The divergence is about 2 or 3 degrees. Everything normal onboard.)

MCC-M (Roger, Soyuz. Thank you very much. The last comm session was very short, and there were some changes.)

SCDR (We hear you intermittently.)

MCC-M (Roger your report, Soyuz.)

SCDR (Moscow, everything is normal.)

MCC-M (Roger.)

SCDR (69th mark on normal. Over.)

SCDR (Moscow, this is Soyuz. We have engine fire. Stabilization is stable.)

MCC-M (Roger.)

SCDR (The engine fired in a stable mode for 20 seconds.)

MCC-M (Roger, Soyuz.)

SCDR (40 seconds.)

SCDR (90 seconds; firing normal.)

MCC-M (Roger. 90 seconds.)

SCDR (2 minutes; normal firing.)

MCC-M (Roger; 2 minutes.)

SCDR (Everything operating normally.)

KIO (This is Soviet Mission Control Center. Moscow time is 13 hours 16 minutes. The last - final stage of the flight of the Soyuz spacecraft has begun. Now it has left the zone of coverage of the Ascension Island tracking station and also the tracking ship. It has approached the coast of Africa near the Gulf of Guinea. According to the crew reports, the engine fired at the calculated time and turned off at 13 hours 13 minutes 38 seconds. At the present time, the auto - automatic onboard equipment is now doing the final programing. This is preparation for separation of the modules and also the maneuvering and control on the - the orbit and entry into the atmosphere section. According to calculation, separation of the modules shall take place at 13 hours 22 minutes 26 seconds. At that moment, the altitude of flight will be 153.8 kilometers. This is Moscow Mission Control Center.)

END OF TAPE



ASTP (USSR) MISSION SR173/1  
Time: 05:21 CDT, 141:59 GET  
7/21/75

KIO (This is Soviet Mission Control Center. Moscow time, 13 hours 21 minutes. Until the separation of the modules of the Soyuz spacecraft, 1 minute remains. The height of the altitude of the flight at that moment will be 153.8 kilometers. Somewhat later, at 13 hours 26 minutes and 48 seconds, at the height of 104 kilometers - altitude of 104, the descent vehicle will enter the atmosphere. This is Moscow Mission Control Center.)

KIO (Separation of the modules of the Soyuz spacecraft has taken place. This data was received by signals transmitted from the orbital module of the spacecraft Soyuz.)

KIO (This is the Soviet Mission Control Center; 12 hours 24 minutes, Moscow time. The distance between the spacecraft and the landing site was approximately 4000 kilometers. In 1 minute, the Soyuz spacecraft and its descent vehicle shall - will enter the atmosphere.)

CC-M (Soyuz, this is Moscow. I can hear you.)

USSR (Roger. Everything on board is normal. Separation was on time. Everything is working the - the descent - retrofire engine worked fine. The engine fired on schedule and at the proper time. The engines were switched on. The button was pushed. Everything better.)

CC-M (Continue your report, please. We are listening to you.)

USSR (You can hear the engine firing, and we can see it through the porthole. There is - the spacecraft is - is moving very smoothly. We can hear the control thrusters. The parameters - no - the parameters - the light indicating atmosphere is not lit yet. The crew is feeling well - normally. Everything is battled down. Nothing is floating around. The pressure is 800, temperature is 20. Everything is proceeding as programmed.)

CC-M (Roger, Soyuz. So far we hear you excellently. We can see flashes.)

CC-M (Soyuz, this is Moscow. How do you read me now?)

KIO (13 hours 28 minutes, Moscow time. Distance between the spacecraft from the landing site is 2000 kilometers. The onboard - the commentary from onboard the spacecraft is proceeding.)

KIO (Soyuz, this is Moscow. So far, we can't hear you. Apparently, you have - been there.)

KIO (13 hours 29 minutes 40 seconds, Moscow time. Distance between the spacecraft and the landing site was 1400 kilometers. At the present time, the Soyuz spacecraft - the land - the descent vehicle crossed the Caspian Sea and is now flying around Guryev around the - in the vicinity of the city Guryev.)

KIO (13 hours 30 minutes 50 seconds, Moscow time. The distance between the spacecraft and landing point was 970 kilometers.)

CC-M (Soyuz, this is Moscow. How do you read?)

KIO (At 13 hours, 31 minutes 50 seconds, distance between the spacecraft Soyuz and the landing site. At the present time, the descent vehicle of the Soyuz spacecraft 19 is approaching Tourgai - the city of Tourgai in the Kazakh SSR.)

KIO (13 hours 32 minutes 20 seconds. Distance between the spacecraft Soyuz from landing point is 460 kilometers.)